

REMARKS

The Office Action dated February 12, 2008, has been received and carefully reviewed. The preceding amendments and following remarks form a full and complete response thereto. Claims 1 and 19 have been amended. Support for the amendments can be found, inter alia, at paragraphs 0008-0009 of the specification. No new matter has been added by the amendment. Accordingly, claims 1-32 are pending in this application and are submitted for consideration.

Claims 1-9, 16, 17, 19-22, 24-28, 31, and 32 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,301,047 to Hoshino et al. ("Hoshino") in view of U.S. Patent No. U.S. 6,628,439 to Shiozawa et al. ("Shiozawa"). Applicants respectfully traverse the rejection and submit that claims 1-9, 16, 17, 19-22, 24-28, 31, and 32 recite subject matter that is neither disclosed nor suggested by the combination of Hoshino and Shiozawa.

Independent claim 1, upon which claims 2-18 depend, defines a method for testing the authenticity of a security element on the basis of liquid-crystalline materials. The security element includes either (1) at least two markings - - at least one first marking with right handed circularly polarizing liquid-crystalline material and at least one second marking with a left-handed circularly polarizing liquid-crystalline material, or (2) only a single marking that contains both right-handed and left-handed circularly polarizing liquid-crystalline material. To test the authenticity of the security element, the light reflected by the security element is filtered by a first circular polarizer in a first polarization direction and an image of the security element is captured and the intensity of the light is determined. The light reflected by the security element is also

filtered through a second circular polarizer in a second polarization direction and a second image is recorded and the intensity values are determined. A differential image is determined by subtracting an intensity value of a partial area of the first image from a respective intensity value of the corresponding partial area of the second image. Based on the differential image, the authenticity of the of the security element can be determined.

Independent claim 19, upon which claims 20-32 depend, defines an apparatus for authenticity testing a security element on the basis of liquid-crystalline materials. The security element includes (1) at least two markings - - at least one first marking with right handed circularly polarizing liquid-crystalline material and at least one second marking with a left-handed circularly polarizing liquid-crystalline material, or (2) only a single marking that contains both right-handed and left-handed circularly polarizing liquid-crystalline material. The apparatus includes at least one left-handed circular polarizer and one right handed circular polarizer. Additionally, the apparatus includes at least one image recording apparatus for recording one or several images of the security element and determining the respective intensity values. The apparatus also includes means for determining a differential image that subtracts the intensity values of corresponding partial areas of a left-handed and a right-handed circular image.

As a result of the recited configurations, the claimed invention includes a novel, non-obvious method and system for checking security elements that are based on liquid-crystalline materials wherein a differential image is determined on the basis of images recorded with the aid of circular polarizers (i.e., both right-handed and left-

handed). Moreover, the method and apparatus process a security document that includes (1) at least two markings - - at least one first marking with right handed circularly polarizing material and at least one second marking with a left-handed circularly polarizing material, or (2) only a single marking that contains both right-handed and left-handed circularly polarizing material.

In contrast to the claimed invention, Hoshino discloses a system for preventing forgery of two-dimensional and three-dimensional objects such as passports, cards, security notes, gift certificates, etc. Hoshino describes a device for optically identifying the authenticity of an object which includes a diffraction grating with a high polymeric cholesteric liquid crystal layer. Two identification devices 20 and 21 receive the reflected light of two light sources. Identification device 20 receives right-handed polarized light and the identification device 21 receives left-handed polarized light. See, e.g. Hoshino at col. 8, line 14 - col. 9, line 4; Fig. 11. However, in contrast to the subject matter of amended claims 1 and 19, Hoshino fails to disclose or suggest that a determination be made of a differential image of intensity values of corresponding portions of the first and second image. Rather, Hoshino merely describes the use of one cholesteric liquid crystal and fails to describe or suggest the use of both right-handed and left-handed circularly polarizing materials disposed together in one marking or disposed separately in two markings as required by both claims 1 and 19.

Shiozawa fails to remedy the above-described deficiencies of Hoshino. Namely, Shiozawa only discloses a reflecting layer which reflects either left-handed circularly or right-handed circularly polarized light. See Shiozawa at col. 4, line 48 - col. 5, line 10. Shiozawa also describes that a hologram is arranged on the reflecting layer, which

reflects light with the same or the other polarization direction compared to the reflecting layer. Accordingly, Shiozawa merely combines the polarizing features of a reflecting layer with the polarizing features of a hologram. That is, in contrast to the subject matter of claims 1 and 19, Shiozawa fails to describe the use of markings which include both a right-handed circularly and left-handed circularly polarizing liquid crystalline material. Thus, Shiozawa fails to remedy the above-described deficiencies of Hoshino.

Therefore, the combination of Hoshino and Shiozawa fails to disclose or suggest each and every element of claims 1 and 19. Applicants, therefore, respectfully request the withdrawal of the rejections of claims 1 and 19 as well as their dependent claims 2–9, 16, 17, 20–22, 24–28, 31, and 32.

Claims 10-14, 29, and 30 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Hoshino as modified by Shiozawa as applied to claims 1 and 19 above, and further in view of U.S. Patent No. 5,815,598 to Hara et al. ("Hara"). Applicants respectfully traverse the rejection on the basis that claims 10-14, 29, and 30 recite subject matter neither disclosed nor suggested by the combination of Hoshino, Shiozawa, and Hara.

Claims 10-14 are patentable for at least the same reasons stated above with respect to claim 1, from which they depend. Similarly, claims 29 and 30 are patentable for at least the same reasons stated above with respect to claim 19, from which they depend. Hara merely discloses an individual identification apparatus that is capable of reading a hologram of a fingerprint (See, e.g., Abstract of Hara) and fails to cure the above described deficiencies in the combination of Hoshino and Shiozawa. Applicants, therefore, respectfully request withdrawal of the rejections of claims 10-14, 29, and 30.

Claims 15 and 23 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Hoshino as modified by Shiozawa as applied to claims 1 and 19 above, and further in view of U.S. Patent No. 6,729,541 to Kurokawa et al. ("Kurokawa"). Applicants respectfully traverse the rejection on the basis that claims 15 and 23 recite subject matter neither disclosed nor suggested by the combination of Hoshino, Shiozawa, and Kurokawa.

Claim 15 is patentable for at least the same reasons stated above with respect to claim 1, from which it depends. Similarly, claim 23 is patentable for at least the same reasons as claim 19, from which it depends. Kurokawa merely discloses an information reading apparatus for reading reflected light from an information recording medium and fails to cure the above described deficiencies in the combination of Hoshino and Shiozawa. Applicants, therefore, respectfully request withdrawal of the rejection of claims 15 and 23.

Claim 18 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Hoshino in view of Shiozawa. Applicants respectfully traverse the rejection on the basis that claim 18 recites subject matter neither disclosed nor suggested by the combination of Hoshino and Shiozawa.

This rejection adds nothing to the rejection of claim 1. Thus, Claim 18 is patentable for at least the same reasons stated above with respect to claim 1, from which it depends. Applicants, therefore, respectfully request withdrawal of the rejection of claim 18.

In view of the above, all objections and rejections have been sufficiently addressed. Applicant submits that the application is now in condition for allowance and request that claims 1-32 be allowed and this application passed to issue.

In the event that this paper is not timely filed, the Applicant respectfully petitions for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account No. 02-2135.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the Applicant's undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

Respectfully submitted,

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